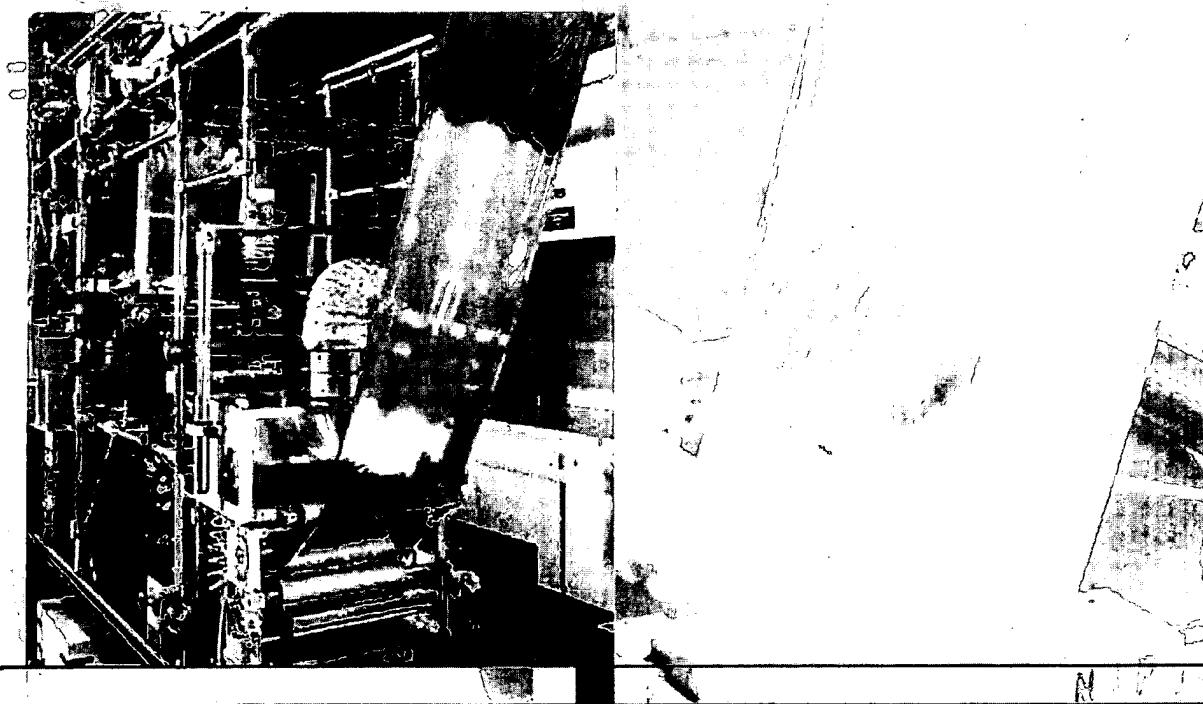


**ExxonMobil**  
*Chemical*

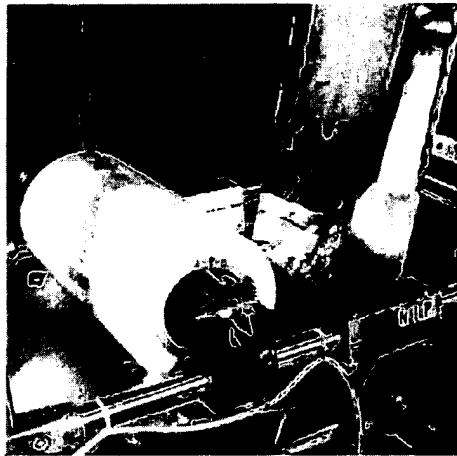
## Lamination



**RK Print-Coat Laboratory Lamination and Printing Line,**

*European Technology Center*

**RK Print-Coat Laboratory  
Lamination and Printing Line  
European Technology Center**



**Technical specifications**

Gravure coating head (Industry standard for solvent-based adhesives)

Gravure offset coating head

Maximum web width

305 mm

Width of the applicator rolls

280 mm (gravure coating)  
265 mm (offset gravure coating)

Two air drying ovens

Heated lamination nip

Maximum line speed

20 m/min

One corona treating station

Inner diameter of the cores to be used

76 mm

*A peristaltic pump can supply the solvent-based adhesive to the coating head to allow production of longer reels with tight coating weight distribution.*

**Testing facilities**

**Test**

**> FILM CHARACTERIZATION**

Seal performance

Hot tack  
Seal initiation temperature  
Seal strength  
Seal through contamination

Adhesion strength

Water vapor transmission rate (WVTR)  
Oxygen transmission rate (OTR)

**Conversion factors**

From mm to inch multiply by 0.039370

From inch to mm multiply by 25.40



Testing facilities

Mechanical properties

Tensile properties  
Puncture resistance  
Coefficient of friction (COF)  
Elmendorf tear

Test

> **GRADE (& FILM) CHARACTERIZATION**

Odor & off-taste (Sensory evaluation)

**GRADE (FILM) CHARACTERIZATION**

- > Form, Fill & Seal line
- Seal performance
- Seal integrity
- Packaging speed
- Sealing window

**Multi-layer film structures**

The purpose of multi-layer film structures is property association of different components in order to optimize the packaging performance.

- > Polyethylenes: sealing performance & package integrity, consistent COF, mechanical properties and good organoleptics
- > Substrates: aluminum foil, (metallized) OPET, OPP, OPA
- Barrier: moisture, gas/oxygen, aroma and light barrier
- Packaging appeal: printing, stiffness

The three main processing categories for producing flexible multi-layer structures are:

- > Blown film or cast film co-extrusion
- > Extrusion coating, with either mono or co-extrusion coating
- > Lamination process



## Lamination

### VARIOUS LAMINATION TECHNOLOGIES

- ▷ **Adhesive lamination**  
by means of an adhesive layer, applied onto one of the substrates prior to combination.
- ▷ **Extrusion lamination**  
a molten polymer web (mostly polyethylene) serves as a tie layer.
- ▷ **Thermal (or heat) lamination**  
by melting the adhesive layer(s), either by heated rollers or an (IR) heated oven prior to combination.

Adhesive and extrusion lamination are the most commonly used processes in today's packaging business.

- ▷ **Main advantages**  
flexibility to produce different structures (short runs)  
possibility to use non-polymeric substrates  
protection of printing against abrasion

### REQUIREMENTS FOR LAMINATION STRUCTURES

- ▷ Good sealing performance: package integrity & high line speeds on packaging lines
- ▷ Appropriate CWF and CCF consistency: smooth converting and packaging operations
- ▷ Comply with food law or health-care requirements where applicable
- ▷ High barrier properties: long shelf life of packed products
- ▷ Good mechanical properties

### ADHESIVE LAMINATION

**Wet bonding:** the 2 webs are combined while the adhesive is still wet. This limits the process to applications in which one of the substrates is porous enough to allow the adhesive solvent to escape.

**Dry bonding** for non-porous substrates which can not be wet bonded

- ▷ **Adhesives types**  
polyurethane-based adhesives  
polyether-based adhesives  
polyester-based adhesives  
polyether / polyester-based adhesives  
acrylic adhesives

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